REMARKS

Applicants request favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims 71, 73-75, and 77-88 are presented for consideration. Claims 71, 75, 79, 82, and 86 are independent. Claims 71, 75, 79, 82 and 86 have been amended. Support for these claims may be found in the original application, as filed. Therefore, no new matter has been added.

The specification has been amended at lines 2 and 3 of page 17 and elsewhere to change "refractive optical element" to "diffractive optical element" to correct an inadvertent error in denoting elements which are properly disclosed elsewhere in the specification (e.g., at line 14 of page 13 with reference to Fig. 1) as diffractive optical elements. No new matter is believed to have been added.

Claims 71, 82 and 83 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,648,874 (Sawaki et al.). Claims 73 and 74 depending from Claim 71 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sawaki et al. Claims 84 and 85 depending from Claim 82 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sawaki et al. With regard to the claims as currently amended, these rejections are respectfully traversed.

Independent Claim 71 as currently amended is directed to a diffractive optical element used for an optical system of an exposure apparatus. In the diffractive optical element, a peripheral area surrounds an effective area. A light shielding member composed of a laminated layer of Cr oxide and Cr is disposed on a surface of the peripheral

area. The laminated layer has an alignment mark that centers the diffractive optical element in an optical barrel.

Independent Claim 82 as currently amended is directed to a diffractive optical element used for an optical system of an exposure apparatus. In the diffractive optical element, a peripheral area surrounds an effective area. A light shielding member composed of any one of (i) chromium, aluminum, molybdenum, tantalum and tungsten, (ii) a laminated structure of any one of chromium, aluminum, molybdenum, tantalum or tungsten and any one of chromium oxide, silicon oxide or aluminum oxide, (iii) a compound material of a metal and silicon, and (iv) a compound of any one of molybdenum or tungsten and silicon, silicon, or titanium oxide, is disposed on a face of the peripheral area. The light shielding member has an alignment mark that centers the diffractive optical element in an optical barrel.

In Applicant's view, Sawaki et al. discloses an optical apparatus having a first lens array consisting of plural lenses that form a reduced image in reversed orientation. A second lens array having plural lenses arranged at corresponding positions to the lens of the first lens array form an erected equal magnification image from the reduced image by expanding the reduced image in the given magnification. One or more light shielding films arranged between the first lens array and the second lens array have through openings to pass light discharged from respective lens of the first lens array at positions corresponding to respective lens of the first lens array in opposition to respective lens that pass discharged light from respective lens of the first lens array.

According to the invention defined in Claims 71 and 82, a diffractive optical element has a peripheral area surrounding an effective area and a light shielding member in

the peripheral area. The light shielding member includes a laminated layer that has an alignment mark for centering the diffractive optical element in an optical barrel. This feature is disclosed at least at lines 1 through 6 of page 17 in the specification. No new matter is believed to have been added.

Sawaki et al. may show an alignment mark at a side of a substrate. As clearly disclosed at lines 58-62 of column 15 in Sawaki et al. with respect to Fig. 13B, the alignment mark is formed by etching a substrate through a titanium layer. The alignment mark is then used to determine positions of later formed lenses and a later formed light shielding film. In contrast to Sawaki et al., It is a feature of Claims 71 and 82 that a laminated light shielding member formed in a peripheral area surrounding an effective area of a diffractive optical element includes an alignment mark for centering the diffractive optical element in an optical barrel. The Sawaki et al. disclosure is devoid of any suggestion of the use of an optical barrel for a diffractive optical element or an alignment mark in a light-shielding member of a peripheral area that centers the element in an optical barrel as in Claims 71 and 82. Accordingly, it is not seen that Sawaki et al. in any way teaches or suggests the features of Claims 71 and 82. It is therefore believed that Claims 71 and 82 as currently amended are completely distinguished from Sawaki et al. and are allowable.

Claims 75, 77-81 and 86-88 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sawaki et al. With regard to the claims as currently amended, this rejection is respectfully traversed.

Independent Claim 75 as currently amended is directed to a diffractive optical element used for an optical system of an exposure apparatus. In the diffractive

optical element, a peripheral area surrounds an effective area and a light shielding member composed of a material selected from the group consisting of TiC, TiN, ZrC, HfC and HfN, is disposed on a surface of the peripheral area. The material disposed on the surface of the peripheral area has an alignment mark that centers the diffractive optical element in an optical barrel.

Independent Claim 79 as currently amended is directed to a diffractive optical element used for an optical system of an exposure apparatus. In the diffractive optical element, a peripheral area surrounds an effective area. A light shielding member composed of an acrylic or epoxy light-shielding ink is disposed on a face of the peripheral area. The light shielding member has an alignment mark that centers the diffractive optical element in an optical barrel. The light-shielding ink is not exposed to an outside of the diffractive optical element.

Independent Claim 86 as currently amended is directed to a diffractive optical element in which a peripheral area surrounds an effective area. A light shielding member is disposed on a surface of the peripheral area. The light shielding member has an alignment mark that centers the diffractive optical element in an optical barrel.

It is a feature of Claims 75, 79 and 86 that a light shielding member on the periphery of the effective area of a diffractive optical element includes an alignment mark for centering the diffractive optical element in an optical barrel. As discussed with respect to Claim 71 and 82, Sawaki et al. only teaches forming a marker at a side of a lens array by etching the substrate through a titanium layer and is devoid of any suggestion of centering the lens array in an optical barrel as in Claims 75, 79 and 86. After being formed, the marker of Sawaki et al. is used to determine positions of later formed lenses and a later

formed light shielding film of the lens array. Accordingly, it is not seen that Sawaki et al.'s lens and light shielding film position determining marker in any manner teaches or suggests the features of Claims 75, 79 and 86 of a diffractive optical element alignment mark that centers the element an optical barrel. It is therefore believed that Claims 75, 79 and 86 are completely distinguished from Sawaki et al. and are allowable.

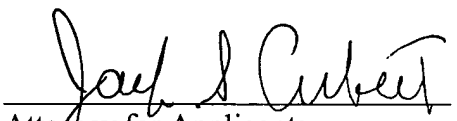
A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record. Applicants submit that the amendments to independent Claims 71, 75, 79, 82, and 86 clarify Applicants' invention and serve to reduce any issues for appeal.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration or reconsideration, as the case may be, of the patentability of each on its own merits is respectfully requested.

Applicants submit that this Amendment After Final Rejection clearly places this application in condition for allowance. This Amendment was not earlier presented because Applicant believed that the prior Amendment placed the application in condition for allowance. Accordingly, entry of the instant Amendment, as an earnest attempt to advance prosecution and reduce the number of issues, is requested under 37 CFR 1.116.

Applicants' attorney, Steven E. Warner, may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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